

Verntaflat Fire

Emergency Stabilization and Rehabilitation (ESR) Plan

Final Accomplishment Report for 2000-2003 Treatments

AGENCY/UNIT: U. S. Fish and Wildlife Service
Hanford Reach National Monument/ Saddle Mountain National Wildlife
Refuge

LOCATION: Richland, Washington

DATE: August 25, 2003



Submitted by: _____ Date: _____
Gregory M. Hughes, Project Leader, Hanford Reach National Monument

List of Preparers

This document has been prepared in conformance with final reporting requirements outlined in the Department of Interior Departmental Manual, Part 620: Wildland Fire Management; Chapter 3: Burned Area Emergency Stabilization and Rehabilitation.

This report has been prepared by:

David N. Smith, Supervisory Natural Resource Specialist, U.S. Fish and Wildlife Service

Heidi L. Newsome, Wildlife Biologist, U.S. Fish and Wildlife Service

Jennifer K. Meisel, Biological Technician, U.S. Fish and Wildlife Service

Jenna Gaston, Cultural Resource Specialist, U.S. Fish and Wildlife Service

Cost Summary Table: Vernitaflat fire Hanford Reach National Monument	Treatment Unit	# of Units	Approved ESR Plan Expenditure	Total Expenditures	Cost per unit	Implementation method
Item						
Ecological Restoration			\$36,160			
Consultation	hours	5		\$120.00	\$20.00	C
Cultural clearance labor	acres	120		\$4,650.00	\$38.75	P
Native Seed mix purchase	acres	120		\$21,555.60	\$179.63	C
Native Seeding labor & materials	acres	120		\$15,985.00	\$133.21	P
Herbicide	acres	120		\$10,000	\$83.33	C
Herbicide treatment labor	acres	120		\$10,550.00	\$87.92	P
Fence Replacement materials and labor			\$42,240			
Materials and Supplies	linear foot	5,280		\$6,919.40	\$1.31	C
Labor	linear foot	5,280		\$8,620.00	\$1.63	P
Total			\$78,400	\$78,400.00		

**U.S. DEPARTMENT OF THE INTERIOR
EMERGENCY STABILIZATION AND REHABILITATION PLAN**

PART A FIRE LOCATION AND BACKGROUND INFORMATION

Fire Name	Vernitaflat	Date Controlled	
Fire Number	Rehab Acct. # 13700-9262-1520	Jurisdiction	ACRES
Agency Unit	FWS Hanford Reach NM	FWS - Saddle Mt. NWR	120
Region	FWS - Region 1		
State	Washington		
County(s)	Grant		
Ignition Date/Manner	August 24, 2000/Lighting strike		
Zone	Pacific Northwest		
Date Contained	August 25, 2000	TOTAL ACRES	120

PART B: NATURE OF PLAN

I. Type of Plan (check one box below)

<input checked="" type="checkbox"/>	Short-term Rehabilitation (Complete Parts A, B, C, and H only)
<input type="checkbox"/>	Long-term Rehabilitation (Complete all parts)
<input type="checkbox"/>	Both Long and Short-term Rehabilitation (completed all parts)

II. Type of Action (check one box below)

<input type="checkbox"/>	Initial Submission
<input type="checkbox"/>	Updating or Revising the Initial Submission
<input type="checkbox"/>	Supplying Information for Accomplishment to Date on Work
<input type="checkbox"/>	Different Phase of Project Plan
<input checked="" type="checkbox"/>	Final Report (To Comply with the Closure of the EFR Account)

Background:

On August 24, 2000 a lightning strike caused a 120 acre fire on the Saddle Mountain National Wildlife Refuge Unit of the Hanford Reach National Monument. The location of the fire was just north and adjacent to Hwy 24 in Grant County, T 14 N, R 25 E, sections 21, 22, 27 and 28. The fire burned during 2 periods, the initial burn followed ignition at 4:30 am and was contained by 7 am. At approximately 5 pm, a dust devil spread embers outside the containment line causing additional burning. The second area was contained by approximately 8 pm. The early morning fire burned with low intensity leaving a mosaic of partially burned plants and areas of near complete consumption.

The area was assessed and both ecological and facilities damage were noted. A Rehabilitation Plan for the area was prepared November 3, 2000 and submitted December 4, 2000. Approval of the plan occurred on February 16, 2001. It is attached as Appendix A.

An implementation schedule was outlined following the approval of the plan. It is attached as Appendix B.

Accomplishments:**A. Ecological Rehabilitation**

A field visit was conducted immediately following notification of the Rehabilitation plan approval. The winter of 2000/2001 was fairly mild, and native forbs were already emerging and growing by mid-February 2001. The initial herbicide treatment was postponed until fall of 2001.

A consultation with local ecologist and expert in shrub-steppe restoration took place in Spring 2001. Biological staff contracted J. Benson to provide expertise and advice on rehabilitation of the fire area. Following this field meeting, a native seed mix was developed.

Seed mix recommendations were to include 4 native grass species, and 1 native forb species. A contract was developed using the following specifications for the native seed mix. The seed had to include locally derived ecotype seed, and be sold on a PLS (pure live seed) basis. Pure live seed indicates how much of the seed will be viable after the seed has been tested for germination and purity. The mix was developed during the field visit by recording species that were present or were historically at the fire location. The mix was developed with the relative abundance of each species in mind, as well as the size of the seeds (number of seeds per pound). The native seed mixture contained the following; Sandberg's bluegrass (*Poa sandbergii*), Indian Ricegrass (*Oryzopsis hymenoides*), Yarrow (*Achillea sp.*), Needle and Thread grass (*Stipa comata*), and Thick-Spike Wheatgrass (*Agropyron dasystachum*).

The following is the description and amounts used in the seed mix:

Native seed mix:

3 # PLS Sandberg's blue grass (Hanford)

4 # PLS Schwindimar Thickspike wheatgrass

0.5 # PLS Nezpar Indian Rice Grass

0.2 # PLS White Yarrow
1.12 # PLS Needle and Thread (Hanford)
(8.82 # PLS/acre)

The rehabilitation method chosen was to broadcast the native seed and harrow the seed to achieve light seed to soil contact.

A Section 106 (National Historic Preservation Act) cultural resources clearance for this activity was conducted in accordance with 36 CFR 800 regulations by the staff Cultural Resource Manager. Although both prehistoric and historic cultural material was located within the project area, but only one item, an isolated projectile point, constituted a site (See details under C.). Mitigation called for avoidance of the artifact utilizing a flagged area as a protective buffer.

The majority of the rehabilitation efforts were carried out in November, 2001, and required the work of 5 US Fish and Wildlife Service (USFWS) employees. The Refuge Operations Specialist, Engineering Equipment Operator and Maintenance Worker operated the tractor and large harrow, while the Wildlife Biologist and Biological Technician used ATV's to broadcast and harrow the native seed.

A total of 1200 pounds of native grass seed was spread on the site by tractor at approximately 10 lbs per acre (correlating to 8 lbs per acre of pure live seed {PLS}).

An experiment using two different liquid nutrient treatments (seed coats), one consisting of a nutrient treatment alone, while the other was a treatment of nutrients and mycorrhizae was initiated. Each treatment was applied to 1/4 of the total seed (300 lbs per treatment) to determine if either of the treatments would benefit the growth and establishment of the seed, when compared with untreated seed. Of the total 1200 lbs of seed, 600 lbs was left untreated as a control, 300 lbs was treated with the nutrient mixture, and the remaining 300 lbs was treated with the nutrient and mycorrhizae mixture.

An additional experimental plot to monitor the potential for cheatgrass (*Bromus tectorum*) control was also established. The biological control agent being tested consists of a soil bacterium that inhibits the root growth of cheat grass. The experimental plot contained three different combinations of treatments (1) seeding followed by harrowing, (2) harrowing followed by seeding, and (3) harrowing, seeding, harrowing. Uncoated native seed was applied to the ground, the liquid biocontrol was sprayed on each experimental plot after the seed was applied. The biocontrol was applied at the same rate for each of the three treatment options. It is hoped that this control method will allow the native grasses a competitive edge during establishment.

An aerial application of RoundUp® herbicide was scheduled for late winter following the seeding. This application was intended to control cheat grass and release the native grass seed from competition. (The biological control experiment was to be covered with tarps during the spraying event). The application was attempted on 3 different occasions during winter 2001/2002, and on all occasions the weather was too windy to conduct the aerial spray operations. Following the last attempt to spray on March 13, 2002, a field visit indicated that

many of the native plants were growing and that the time window to spray was over. Thus, the site did not receive any treatment of herbicide.

Because the native grass had the opportunity to germinate and grow during 2002, no treatment with RoundUp® was conducted in 2002/2003. A newer product called Plateau®, which is specific to cheat grass will be attempted in winter 2003/2004. This may give the emerging native grasses a chance to express.

Because there is still the opportunity to use herbicides to try to encourage native grass establishment, no sagebrush has been planted in the area as of this date.

Monitoring efforts indicate that much of the area is still infested with cheat grass. This was do to the inability to treat during the winter months. However, native forbs in the area seem to be emerging and establishing. Native hoary aster (*Macheranthera canescens*) is quite abundant, as is yarrow (*Achillea sp.*), dune scurfpea (*Psoralea lanceolata*), and Carey's balsamroot (*Balsamorhiza careyana*). Further monitoring needs to be conducted to assess the establishment of the seeded native grass species.

B. Facilities Rehabilitation

One mile of 4-strand barbed wire fence with wooden posts was damaged during the fire. Materials to replace the fence were purchased. Wooden posts were replaced with more durable steel T-posts, and new wire was purchased to replace the heat damaged wire. The Youth Conservation Corp (YCC) crew with assistance from the Maintenance staff were used as labor to remove the damaged fencing and to install the replacement fencing.

Fire lines were established just inside the fence along the Highway adjacent to this burned area. These fire lines have been maintained annually to protect the recovering burned area from a possible re-burn.

C. Cultural Resources Investigation

A preliminary records check of the project area revealed no known cultural sites and no surveys had been undertaken in the immediate vicinity. Numerous prehistoric sites and several historic homestead are known along the Columbia River just over a mile to the south. However, the location of the project on a high ridge above the river precludes easy access to the closest water source.

The project area was surveyed with parallel, North/South transects along the fire break line and Northwest/Southeast trending transects following the topographic features of the seeding area. Transects were spaced about 20 meters apart. The bulk of the cultural material located within the project consisted of historic items such as cans, wire, metal pieces, buckets, wood fragments and an occasional glass bottle or jar fragment. Most of the material was scattered and did not constitute an archaeological site (did not meet the quantity or temporal significance threshold). One debris area did have a concentration of a variety of material including cans, metal buckets,

wire, burned lumber, rebar , cinder blocks, floor tile and masonite. However, there was no associated structure or evidence of foundations, leveled living area and so forth. The material was more likely hauled to this locale and discarded.

The time frame suggested by the floor tiles, cinder blocks and masonite indicate a 1950's to 1960's time frame. The only conclusive date on an artifact is a 5 gallon oil can with a 5-24-51 date on the bottom. The bulk of the material seems to represent construction (or in this case destruction?) activity as there is no typical household or domestic debris such as glass jars or bottles for food containers. Only five food type cans were noted. Potentially the material is related to military activity in the area in the 1960s. Thus, the site was not considered significant in terms of the National Register of Historic Places criteria and no mitigation was deemed necessary.

The only site recorded during the project survey is an isolated projectile point. The point probably dates to the middle period in the regional cultural chronology of 4500-2500 B.P. No other prehistoric material was observed during the survey. The morphology of the point is a somewhat squatty side-notched type with an indented, slightly eared base. It is made from a primary cryptocrystalline silicate flake which still retains its curvature and some cortex. One face of the point has little modification except around the edges. Since there is a no collection policy on the Monument, the point was avoided and seeding activities restricted with a protective buffer of 30m and monitored to ensure protection of the resource.

Photo documentation: Verntaflat fire



Using the ATV with harrow to increase seed/soil contact



Native seed mix used to re-seed area



Initiation of experiment to test potential biological control agent for cheat grass



Seeder spreader for ATV



Using ATV with harrow to increase seed/soil contact



Photo of burned area



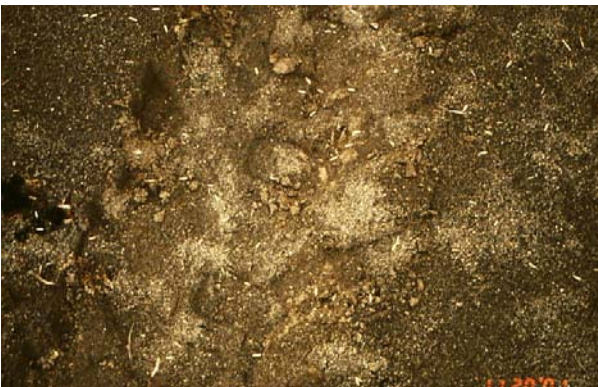
Tractor used to conduct seeding and harrowing



ATV harrow



Spear point located during cultural resource survey



Distribution of Native Seed Mix



Rehabilitation area in spring 2001 before treatments. Note cheat grass abundance.

APPENDIX A:
VERNTAFLAT WILDFIRE - Rehabilitation Plan

I. Background

A. Verntaflat Fire, August 24, 2000

1. The fire was located on the Hanford Reach National Monument/Saddle Mountain National Wildlife Refuge, located in T 14 N, R 25 E sections 21,22, 27 and 28 in Grant County, WA just north of State Highway 24. Using GPS data collected around the perimeter of the fire, 119.2 acres burned. The fire was lightning caused and the point of origin was an observed lightning strike.
2. Soils are sandy, with the majority of the area considered silt loam, sandy loam, or sand.
3. The topography is generally flat. Elevation ranges from 500 to 850 feet. The aspect is northeast, but a portion of the fire has a southeast aspect.
4. Climate is arid with approximately seven inches of rainfall annually. Summers are hot (highs about 85-100°) and dry (minimum relative humidity in the teens). This area is subjected to strong winds (averaging 10 mph while the average maximum windspeed is 25 mph) throughout the season. Wind velocity is strengthened by the channelization effect in the river valley.
5. The vegetation consists of big sagebrush and rabbit brush with a Sandberg's bluegrass and cheatgrass in the understory. The cheatgrass component of the burned vegetation had already gone to seed and has probably deposited seed onto the ground that probably survived the fire. There are also pockets of bitterbrush with sand dropseed, and Indian rice grass in the sandier soils.
6. This fire burned during two periods. The initial burn followed ignition at 4:30 AM and was contained by 7 AM. At approximately 5 PM, a dust devil spread embers outside the containment line causing additional burning. The second area was contained by approximately 8 PM. The early morning fire burned with low intensity, a mosaic remains on the burn site.
7. The area burned drains into the Columbia River, which is approximately 1.5 miles away. The sandy soil types promotes infiltration of most moisture. The fire did not burn hot enough to create a hydrophobic layer in the soil. No increased runoff is expected from the fire event. Therefore, the effect of the fire on the local hydrology should be insignificant.
8. This fire is entirely on the Saddle Mountain unit of the Hanford Reach National Monument, which is owned by the Department of Energy, and managed by the U.S. Fish and Wildlife Service.

B. Resource uses.

1. The burned area is closed to the general public.
2. Little resource use occurs in the burned area.

II. Evaluation and Analysis

A. Physical factors

1. Sagebrush does not tolerate fire. Sagebrush regenerates only from seed. Because sagebrush typically flowers in the autumn and produces seed in the late autumn/early winter months, the current seed crop had not yet been produced. Seed remaining in the seed

- bank is from previous seasons and may not be viable or have high germination following the fire.
2. Sagebrush provides a variety of habitat components including; vertical structure, thermal and hiding cover, and a food source. The fire destroyed these components and redevelopment will take years.
 3. Ecosystem structure (sagebrush with a bunchgrass understory) may be compromised by the loss of vegetation.
 - a. Allows for the potential colonization and spread of invasive plants and noxious weeds. Invasion of non-native plants can permanently alter the ability of the area to re-establish a functional native plant community.
 - b. Exposes the surface to wind erosion.
 - c. Finally, the tracks and trails created by fire fighting vehicles have also created a large disturbed area. These track exposed bare soil and disturbed the microbiotic crust of the soil.
 - d. Left untreated, the post-fire environment will lead to the unacceptable degradation of the soils, plant community, and ecosystem function. Seeding with native grasses and planting sagebrush seedlings would provide a locally adapted group of plants that would provide the best protection of these values over the long term.

B. Facilities

1. The refuge was protected by a 4-strand barbed wire fence with wooden posts. This area is closed to public access.
2. One mile of fence was affected by the fire (figure 1).
 - a. Of the posts affected by fire, 330 need to be replaced (figure 2).
 - b. Additionally, the barbed wire loses its tensile strength due to heat. 21,120 feet of barbed wire (4 strands *5,280 feet) was affected by the fire.
 - c. The fence was cut in two places during the suppression operations to let vehicles through to conduct suppression activities. All of the fence affected by the fire will need to be replaced.

C. Off-site factors.

1. Regionally, the decline in both the quantity and quality of sage brush steppe habitats has occurred. Within the Columbia Basin, in excess of 60% of the pre-settlement sagebrush steppe has been converted to other land uses, and much of what remains has been severely degraded by over grazing of livestock. Further, the changes in the fire regime within these ecosystems (more frequent and intense fires) due to the invasion of non-native plants has significantly decreased the amount of mature sagebrush stands region wide.
2. Loss of even a small amount of sagebrush has an impact to the local diversity and abundance of native plant and animal species. There are no longer large reservoirs of habitat which native species can disperse from, and small isolated areas are often separated by inhospitable habitat.
3. Therefore, perturbations of even a small size may result in local declines of certain species. Also, disturbed areas may not be able to recover without intervention of land managers.

- D. Effects on wildlife.
 - 1. Locally, several species of wildlife are considered “sagebrush steppe dependant” species, meaning that all or part of their life-cycle is tied to the presence of sagebrush steppe habitat. Several of these species are considered priority species of concern by the state of Washington due to rapidly declining trends in their populations. These species include; both white and black-tailed jack-rabbits, Washington ground squirrel, burrowing owl, sage grouse, loggerhead shrike, sage sparrow which were likely to occur on the Saddle Mountain National Wildlife Refuge.
 - 2. Elimination of the sage brush cover would have detrimental effects on local populations of all of these species. We expect that the fire potentially caused a decrease in the local abundance of these species.
- III. Rehabilitation Needs and Objectives
 - A. Rehabilitation alternatives
 - 1. Allow normal post-fire community development. We anticipate only weeds to invade the site during the summer. These weeds will prevent native plants from becoming re-established during the next growing season. And, over the long-term will prevent the former native plant community from developing and will permanently alter ecosystem function..
 - 2. Seed area with native grass. This alternative puts seed on the ground to maximize the amount of germinating plants for the upcoming growing season. Following germination of grasses, plant sagebrush seedlings within the fire area to increase the rate of sage establishment. This does not attempt to eliminate the competition from non-native plants.
 - 3. Treat noxious annuals with the herbicide Round-up® or Oust® and seed with native grass. This treatment requires a long time of exposure since the native seeds should not be placed on the site until the Oust® has had six months to treat the annuals. The native grass then would be sown during the second growing season with the expectation that most of the annuals had been eliminated during the first growing season. After grasses become established plant with sagebrush seedlings to increase the rate of sagebrush re-establishment.
 - 4. No action
 - B. Recommendation. Rehabilitation and stabilization of the site. Minimize the success of cheatgrass germination success by application of herbicide followed by native grass seeding. Follow with planting of sagebrush seedlings.
- IV. Environmental Considerations
 - A. The time of the year minimizes the likelihood of success for immediate vegetation. We expect the cheatgrass to germinate in October and November. An application of Round-up ® or Oust® in early October will treat the emerging cheatgrass plants. Seeding with native plant seed needs to be early enough in the winter to allow germinating plant to utilize the moisture and become established before the summer dormant season, early January.
 - B. Rehabilitation Plan compliance with the draft Fire Management plan.
- V. Resource Needs and Costs Summary
 - A. Estimated costs for native plant seed. Seeding rates should be approximately 5-10 lbs. per acre. Seeds cost (Hanford derived seed)

approx \$90 acre for a native seed mix. Estimated cost for herbicide treatment is approximately \$8 acre. Labor cost and equipment cost for spraying, and planting would range from \$ 50-75 per acre (this could be lower if Service equipment and personnel were used). Seedling sage are planted at a density of 300-400 per acre. Seedlings cost \$ 0.20 bare-root and \$0.33 to plant using tree-planting crew. Post planting monitoring would require installing a transect and surveying annually, at GS-5 biological technician for a week of labor (annual cost) (~\$10/hour x 40 hours). The total cost per acre is approximately \$300 per acre, plus annual monitoring cost of approximately \$400. The total cost is estimated to be \$36,160 annually.

- B. Fence costs \$8/linear foot to be replaced for both parts and labor. Total cost for fence replacement is \$42,240 (\$8*5,280 feet)
- C. Grand total for rehabilitation is \$78, 400.

APPENDIX B:
Schedule to Implement the Rehabilitation Plan for the “Verntaflat” fire

March 2001	Assess re-growth within burned area. Spray cheat grass affected areas with herbicide. Spray cheat grass prior to seed set (Round up), so that seed is not produced this season.
April - September 2001	Fallow the site. Order and purchase native grass seed mix.
November-December 2001	Check for regrowth. Spray again if needed (Round up). Prepare seed bed, using harrow. (rent or borrow harrow or shallow disc) (Do this 2 weeks following spray if spray was conducted) Plant native seed mix. (rent or borrow seeder or seed spreader)
Feb. - March 2002	Monitor for emergence of cheat grass. If cheat grass is abundant, conduct an over spray (using Round-up), prior to emergence of sewn perennial grasses.
March - September 2002	Establishment and growth of native perennial grasses.
Nov. - December 2002	If grasses are well established, plant shrub seedlings into the area. Plant shrubs using hand tools and planting crew, spacing approximately 10' between plants.